

WHAT IS CLAIMED IS:

1.     An optical communication device comprising:  
5       a continuous time filter having an adjustable bandwidth,  
wherein the continuous time filter reduces channel induced  
distortion in an incoming data signal, wherein the continuous  
time filter generates a filtered incoming data signal; and  
      a decision feedback equalizer, coupled to the continuous  
10     time filter, for reducing inter-symbol interference in the  
filtered incoming data signal.
2.     The communication device of claim 1 further  
comprising a bandwidth controller that estimates bandwidth  
15     error of the continuous time filter and generates a control  
signal to adjust the bandwidth of the continuous time filter  
to reduce the bandwidth error.
3.     The communication device of claim 1 wherein the  
20     continuous time filter comprises at least one cascaded low  
pass filter.
4.     The communication device of claim 3 wherein each of  
the at least one low pass filter comprises a differential pair  
25     of transistors having adjustable capacitive loads coupled to  
outputs of the differential pair of transistors for adjusting  
the bandwidth of the low pass filter.
5.     The communication device of claim 2 wherein the  
30     decision feedback equalizer comprises a summer that generates  
a combined signals by combining an equalized feedback signal  
with the filtered incoming data signal to reduce the inter-  
symbol interference in the filtered incoming data signal.
6.     The communication device of claim 5 wherein the  
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bandwidth controller comprises:

5        an analog to digital converter, coupled to the summer,  
that digitizes the combined signal;

      a digital limiter, coupled to receive the digitized  
combined signal from the analog to digital converter, that  
generates a binary signal from the digitized combined signal;  
and

10       a combiner that subtracts the digitized combined signal  
from the binary signal to generate a bandwidth error signal.

      7. A communication system comprising:

15       a transmitter transmitting an information signal over a  
communication media; and

      a receiver coupled to the communication media for  
receiving the transmitted information signal, wherein the  
receiver comprises:

20       a continuous time filter having an adjustable  
bandwidth, wherein the continuous time filter reduces channel  
induced distortion in a received information signal as a  
function of the adjustable bandwidth, wherein the continuous  
time filter generates a filtered information signal; and

25       a decision feedback equalizer coupled to the  
continuous time filter for reducing inter-symbol interference  
in the filtered information signal.

30       8. The communication system of claim 7 further  
comprising a bandwidth controller that estimates bandwidth  
error of the continuous time filter and generates a control  
signal to adjust the bandwidth of the continuous time filter  
to reduce the bandwidth error

35       9. The communication system of claim 7 wherein the  
continuous time filter comprises at least one cascaded low

pass filter.

5           10. The communication system of claim 9 wherein each of  
the at least one low pass filter comprises a differential pair  
of transistors having adjustable capacitive loads coupled to  
outputs of the differential pair of transistors for adjusting  
the bandwidth of the low pass filter.

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11. The communication system of claim 9 wherein the  
decision feedback equalizer comprises a summer that generates  
a combined signal by combining an equalized feedback signal  
with the filtered information signal to reduce the inter-  
15 symbol interference in the filtered incoming data signal.

12. The communication system of claim 11 wherein the  
bandwidth controller comprises:

20           an analog to digital converter, coupled to the summer,  
that digitizes the combined signal;

          a digital limiter, coupled to receive the digitized  
combined signal from the analog to digital converter, that  
generates a binary signal from the digitized combined signal;  
and

25           a combiner that subtracts the digitized combined signal  
from the binary signal to generate a bandwidth error signal.

13. The communication system of claim 7 wherein the  
receiver further comprises an optical detector for converting  
30 the received information signal to an electrical signal.

14. A communication system comprising:  
transmission means for transmitting an information signal  
over a communication media;

35           receiver means coupled to the communication media for

1       **51542/SDB/B600** - BP3393

receiving the transmitted information signal, wherein the receiver means comprises:

5               filter means for filtering the received information signal,

              bandwidth control means for adjusting the bandwidth of the filter means to reduce channel induced distortion in the received information signal, and

10              equalizer means coupled to the filter means for reducing inter-symbol interference in the filtered information signal.

15              15. A method for communicating an information signal, comprising:

              filtering a first symbol of an information signal using a first filter bandwidth;

              equalizing the filtered information signal;

20              generating a bandwidth error signal from at least the equalized signal; and

              filtering a second symbol of the information signal with a second filter bandwidth to reduce the bandwidth error signal.

25              16. An optical communication device comprising:

              a continuous time filter having at least one cascaded low pass filter, each of the at least one cascaded low pass filter having an adjustable bandwidth, wherein the continuous time filter reduces channel induced distortion in an incoming data signal, wherein the continuous time filter generates a filtered incoming data signal; and

30              a decision feedback equalizer coupled to the continuous time filter for reducing inter-symbol interference in the filtered incoming data signal.

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17. The communication device of claim 16 further  
comprising a bandwidth controller that estimates bandwidth  
5 error of the continuous time filter and generates at least one  
control signal to adjust the bandwidth of the at least one  
cascaded low pass filter to reduce the bandwidth error.

18. The communication device of claim 16 wherein each of  
10 the at least one low pass filter comprises a differential pair  
of transistors having adjustable capacitive loads coupled to  
outputs of the differential pair of transistors for adjusting  
the bandwidth of the low pass filter.

19. The communication device of claim 17 wherein the  
15 decision feedback equalizer comprises a summer that combines  
an equalized feedback signal with the filtered incoming data  
signal to reduce the inter-symbol interference in the filtered  
incoming data signal.

20. The communication device of claim 19 wherein the  
20 bandwidth controller comprises:

an analog to digital converter, coupled to the summer,  
that digitizes the combined signal;

25 a digital limiter, coupled to receive the digitized  
combined signal from the analog to digital converter, that  
generates a binary signal from the digitized combined signal;  
and

a combiner that subtracts the digitized combined signal  
30 from the binary signal to generate a bandwidth error signal.